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WATER QUALITY MEMORANDUM
Utah Coal Regulatory Program

September 20, 2011

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen, Environmental Scientist SC

RE: 2011 1st Quarter Water Monitoring, Canyon Fuel Company (CFC), LLC, Dugout Mine, C/007/0039-WQ11-1, Task ID #3750

The Dugout Canyon Mine is currently operational in the Book Cliff Mountain range of Carbon County, UT. Water monitoring data is submitted quarterly to the Division EDI database. Beginning on page 7-40 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and Utah Pollutant Discharge Elimination System (UPDES) outfalls. Tables 7-4 and Table 7-5 list the individual monitoring sites and their sampling protocols for ground water and surface water respectively.

1. Was data submitted for all required sites?

Springs YES [X] NO [ ]

The approved MRP outlines the operational and post-mining monitoring of fourteen springs (200, 203, 227, 259 259A, 260, 321, 322, 324, SC-100, SC-116, SC-14, SC-65 and SP-200). The locations of these springs are depicted on Plate 7-1, Hydrologic Monitoring Stations. Groundwater discharge from the old Gilson coal seam workings is also monitored and identified as location MD-1.

None of the 14 spring monitoring sites could be accessed due to snow and ice cover.

Streams YES [X] NO [ ]

The approved MRP outlines the monitoring of thirteen stream sites (323, DC-1, DC-2, DC-3, DC-4, DC-5, FAN, PC-1A, PC-2, PC-3, RC-1, SS-1 and SS-2). Sites DC-4 and DC-5 are sampled during the first wet or dry year as conditions permit. The locations of these streams are depicted on Plate 7-1, Hydrologic Monitoring Stations.

Five of the stream monitoring sites were inaccessible to snow and ice cover. Six of the

stream monitoring sites were accessible with three producing a sufficient flow to obtain a sample (DC-1, DC-2 and PC-2).

Wells YES [X] NO [ ]

The approved MRP outlines the sampling of three monitoring wells (GW-10-2, GW-11-2 and GW-24-1). Table 7-4 and Section 731.200 of the MRP specify that the Permittee will obtain quarterly water level measurements from the wells. Due to the ages of the wells and deterioration of the casing materials, water quality data is not collected.

Monitoring well GW-24-1 became blocked during the winter of 2000 and was last sampled in September of 1998. The well was removed from monitoring after the 4th quarter of 2004. Monitoring well G-11-2 was last monitored in October 2007. Since that time, the Permittee has reported that the well has appeared to have "caved in". Monitoring well GW-10-2 is still functioning and actively monitored for water level.

Though not required by the approved MRP, three additional monitoring wells (DH-1, DH-2 and DH-3) are monitored at the waste rock disposal site. Water levels are monitored quarterly with additional water quality sampling obtained from DH-1 during low flow periods (i.e. 3rd or 4th quarter).

Depths were recorded for wells DH-1, DH-2 and DH-3. Wells GW-10-2 and GW-11-2 were inaccessible due to snow and ice cover.

UPDES YES [X] NO [ ]

Operational monitoring is required monthly for six active UPDES outfalls (Permit No. UT0025593):

- **001**-Mine water discharge to Dugout Ck.,
- **002**-Sedimentation pond discharge to Dugout Ck. (disturbed area runoff),
- **003**-Storage water discharge to Dugout Ck. (30,000-gallon water tank discharge),
- **004**-Sedimentation pond (waste rock site) discharge to Grassy Trail Ck. Tributary,
- **005**-Pace Canyon fan portal breakout, mine water discharge to Pace Ck.
- **006**-Sediment trap culvert discharge to Pace Creek (disturbed area runoff from Pace Canyon Fan facility).

Specific effluent limitations and self-monitoring requirements as outlined in the UPDES permit are presented below:

Effluent Characteristics	Effluent Limitations
TDS, tons/day	1.0
Total Suspended Solids (TSS), ppm	70
Total Iron, ppm	1.1
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,400
pH	9

3,000 parts per million (ppm) is the water quality standard for total dissolved solids (as established by the Department of Water Quality) for both Pace Creek and Dugout Creek.

UPDES outfalls 002 and 005 produced a discharge this quarter.

2. Were all required parameters reported for each site?

Springs YES [X] NO [ ]

None of the spring monitoring sites could be accessed this quarter.

Streams YES [X] NO [ ]

Three stream monitoring sites produced a sufficient enough flow to obtain a sample (DC-1, DC-2 and PC-2). The required parameters were reported for these sites.

Wells YES [X] NO [ ]

Of the three monitoring wells that were accessible this quarter (DH-1, DH-2 and DH-3) the required parameters were reported.

UPDES YES [X] NO [ ]

Of the UPDES sites that reported a discharge this quarter (002 and 005), the required parameters were reported.

3. Were irregularities found in the data?

Springs YES [ ] NO [X]

The Permittee could not access any of the spring monitoring sites due to snow and ice conditions.

Streams YES [X] NO [ ]

Stream monitoring site DC-1 reported an elevated concentration of chloride (Cl). The reported value of 97 parts-per-million (ppm) was 4.38 standard deviations from the average of 16.1 ppm.

Monitoring site DC-2 had reported elevated concentrations for total dissolved solids and it's components during the 2nd quarter of 2010. No observable flow was reported for the 3rd and 4th quarters of 2010. A flow was observed and sampled this quarter. The TDS concentration and associated components were within 2 standard deviations from the mean and appear to follow historic trends.

Stream monitoring site PC-2 had begun to develop an upward trend in TDS and its components. However, since the 3rd quarter of 2009, the reported TDS concentrations havae been within historical trends as established by the data set.

Wells YES [ ] NO [X]

Water level readings obtained from wells DH-1, DH-2 and DH-3. Water levels were within established trends for DH-1 and DH-3. The reported water level for DH-2 was 30.75' which is 2.64 standard deviations from the mean of 37.7'.

UPDES YES [ ] NO [X]

UPDES outfalls 002 and 005 discharged during this quarter.

Outfall 002 reported concentrations within the requirements as established by the UPDES Discharge permit for pH, TDS, T-Fe and TSS.

Outfall 005 reported elevated concentrations for TDS and T-Fe two times during the quarter. On January 30th, 2011, concentrations of 3,500 ppm TDS and 1.1 ppm for T-Fe were reported. On January 21st, 2011, concentrations of 3,710 ppm TDS and 1.7 ppm for T-Fe were reported. The limits established by the Permittee's UPDES discharge permit are 2,400 ppm and 1.1 ppm for TDS and T-Fe respectively.

The Permittee reported to the Division that an upset condition had occurred at the mine. The Permittee indicated that due to safety concerns, a gob area had to be sealed and the mine-water re-routed. As a result of having to prematurely seal the gob area, the water quality of the mine water discharge at the Pace Canyon fan facility (Outfall 005) had been impacted. The Permittee discussed how plans were being developed to pump the mine-water into a piping system that would route the discharge to a series of sediment ponds located on SITLA land several miles down the canyon from the Pace Canyon fan facility. It should be noted that although the January sampling events produced elevated concentrations for TDS and T-Fe, the

remaining sampling events that quarter produced TDS and T-Fe concentrations that were within the established UPDES permit limits and historical trends. On going monitoring will be conducted. The Division will work the Division of Water Quality to determine the most appropriate action to reduce the elevated concentrations.

4. On what date does the MRP require a five-year resampling of baseline water data.

The resampling of baseline data will next be performed in July 2014. In addition, one water sample will be collected at each spring sampling point during low flow period every fifth year, during the year, preceding re-permitting. These samples will be obtained for the analysis of baseline parameters (See Table 7-4).

5. Based on your review, what further actions, if any, do you recommend?

Continued monitoring of UPDES Outfall 005 (mine-water discharge to Pace Creek) to determine if the TDS and T-Fe concentrations are returning to compliant levels.

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